

CLAIMS

1. A method of enriching a pressurized gas stream
5 with one of its constituents A, which comprises the steps of:

i) dividing the stream (1) into at least first and second fractions (2, 3);

10 ii) sending at least one portion of the first fraction (2) into a separation unit (ASU);

iii) supplying, from the separation unit, at least first and second streams, the first stream (10) of which has a content of constituent A greater than that of the first fraction;

15 iv) mixing at least one portion of the first stream with at least one portion of the second fraction in order to form a pressurized gas mixture (15), characterized in that the second fraction is expanded before at least one portion of the first stream is
20 mixed therewith.

2. The method as claimed in claim 1, in which the pressurized gas stream (1) and the first fraction (2) are substantially at the same pressure and, in
25 particular, only the pressure drops are the cause of a variation in pressure between these two fluids.

3. The method as claimed in either of claims 1 and 2, in which the first stream and the expanded second
30 fraction are substantially at the same pressure and, in particular, only the pressure drops are the cause of a variation in pressure between these two fluids.

4. The method as claimed in one of the preceding
35 claims, in which the separation unit (ASU) is autonomous in terms of energy requirements for compressing the gas streams produced by the unit or intended for the unit.

5. The method as claimed in one of the preceding claims, in which the pressurized gas stream (1) is air and optionally constituent A is oxygen.

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6. The method as claimed in claim 5, in which the pressurized gas stream is air intended for a blast furnace (BF).

10 7. The method as claimed in one of the preceding claims, in which the separation unit is a cryogenic distillation separation unit (ASU).

15 8. The method as claimed in claim 7, in which the separation unit (ASU) comprises a medium-pressure column (2A), a low-pressure column (4A) thermally coupled to the medium-pressure column, and a mixing column (6A).

20 9. The method as claimed in claim 8, in which no portion of the first fraction intended for a distillation column is compressed or no portion of the first fraction intended for the mixing column or for the medium-pressure column is compressed after the
25 stream is divided at step i).

10. The method as claimed in one of the preceding claims, in which:

30 i) in a first operation, at least one portion of the first fraction is compressed and the second fraction is not expanded before at least one portion of the first stream is mixed therewith; and

35 ii) in a second operation, at least one portion of the first fraction is not compressed (the first fraction is not compressed) and the second fraction is expanded before at least one portion of the first stream is mixed therewith.

11. An installation for enriching a pressurized gas stream with one of its constituents A, which comprises:

i) means for dividing the pressurized gas stream (1) into at least first and second fractions (2, 3);

5 ii) a separation unit (ASU);

iii) means for sending at least one portion of the first fraction (2) to the separation unit; and

iv) means for mixing at least one portion of a first stream (10), produced by the separation unit and enriched in A compared to the first fraction, with the second fraction in order to form a stream (15) enriched in A compared to the pressurized gas stream, characterized in that it includes a means (V) for expanding the second fraction upstream of the means for mixing at least one portion of the first stream therewith, and downstream of the means for dividing the gas stream.

12. The installation as claimed in claim 11, the separation unit of which is an air separation unit (ASU) comprising a medium-pressure column (3A), a low-pressure column (4A) thermally coupled to the medium-pressure column, and a mixing column (6A).

13. The installation as claimed in claim 12, which does not include any means for compressing air intended for the medium-pressure column or for the mixing column downstream of the means for dividing the gas stream.

14. The installation as claimed in either of claims 11 and 12, which includes means for compressing the second fraction and means for forwarding the second fraction to be mixed with at least one portion of the first stream without passing via the expansion means.